

Message Text

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SUBJECT: CCMS: GEOTHERMAN ENERGY PROJECT MEETING

CALIFORNIA (OCTOBER 1-5, 1973)

REF: STATE 182664

THERE FOLLOWS ADDITIONAL PRELIMINARY PROPOSAL FOR CCMS GEOTHERMAL ENERGY PROJECT. REQUEST POSTS DISTRIBUTE TO APPROPRIATE OFFICIALS (SAME DISTRIBUTION AS THAT REQUESTED REFTEL).

BEGIN TEXT

AS A PART OF THE PROPOSED CCMS GEOTHERMAL ENERGY PROJECT, THE BUREAU OF RECLAMATION OF THE DEPARTMENT OF INTERIOR PROPOSED A COOPERATIVE PROJECT INVOLVING ITS ON-GOING WORK WITH RESPECT TO DEVELOPING A DEMONSTRATION DESALTING PLANT CAPABLE OF DETERMINING THE TECHNICAL AND ECONOMIC VIABILITY OF DESALTING GEOTHERMAL BRINES TO FURNISH AUXILIARY SOURCES OF WATER FOR WATER-DEFICIENT AREAS. NEEDLESS TO SAY, A BY-PRODUCT OF THIS PROJECT COULD BE DETERMINATION OF THE ECONOMIC AND TECHNICAL VIABILITY OF RECOVERING CHEMICALS AND MINERALS FROM GEOTHERMAL BRINES.

A. FACILITIES

1. BUREAU OF RECLAMATION OFFICE OF SALINE WATER DESALTING TEST FACILITIES WERE RECENTLY CONSTRUCTED ON THE MESA HOT-WATER GEOTHERMAL ANOMALY, IN IMPERIAL VALLEY, CALIFORNIA. THE FACILITIES CONSTRUCTED TO DATE INCLUDE TWO GEOTHERMAL PRODUCTION WELLS, ONE OF WHICH CAN BE USED FOR REINJECTION OF WASTE BRINES; TWO DESALTING UNITS, A MULTISTAGE FLASH AND A VERTICAL TUBE EVAPORATOR, EACH HAVING A CAPACITY IN THE RANGE OF 20,000 TO 50,000 GALLONS PER DAY; AND THE NECESSARY PLUMBING AND SUPPORT FACILITIES TO CONDUCT A TESTING PROGRAM.

2. IT IS PROPOSED THAT IN ADDITIONAL DEEP WELLS WILL BE DRILLED FOR PRODUCTION, REINJECTION AND RESERVOIR OBSERVATION USE OVER THE NEXT FIVE YEARS; PRE- AND POST-TREATMENT FACILITIES WILL BE INSTALLED TO

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EVALUATE THEIR EFFECTS ON THE DESALTING OPERATION; A 500,000 GALLON PER DAY PILOT DESALTING PLANT WILL BE DESIGNED AND CONSTRUCTED IN THE 1976 TIME FRAME, USING DATA SECURED FROM THE TEST PLANTS; AND TO COMPLETE THE FACILITY, A TWO-TO-THREE-MILLION GALLONS PER DAY DEMONSTRATION PLANT WITH THE NECESSARY COMPONENT FACILITIES WILL BE DESIGNED AND CONSTRUCTED BEFORE 1980.

B. RESEARCH OBJECTIVES

1. DEVELOP THE TECHNOLOGY NECESSARY TO SUPPORT THE DESIGN OF A LARGE-SCALE, GEOTHERMAL BRINE DESALTING PLANT WHICH WOULD USE SURPLUS GEOTHERMAL HEAT; E.G., SURPLUS HEAT LEFT OVER FROM POWER PRODUCTION.
2. PROCESS STUDIES AND ECONOMIC EVALUATION, EVALUATION OF CORROSION AND SCALING TENDENCIES OF THE BRINES AND VAPORS, FEED PRETREATMENT STUDIES, MATERIAL AND EQUIPMENT EVALUATION, HEAT-TRANSFER STUDIES, AND EFFLUENT DISPOSAL STUDIES.
3. EVALUATE THE CONFIGURATION AND DYNAMICS OF THE MESA HOT-WATER GEOTHERMAL RESERVOIR DURING PRODUCTION. THIS WILL ALLOW DETERMINATION OF THE SIZE, SHAPE, AND DYNAMICS OF HEAT FLOW IN A HOT-WATER RESERVOIR IN ORDER THAT PRODUCTION MAY BE MAXIMIZED BY PROPER LOCATION OF PRODUCTION AND REINJECTION WELLS SO AS TO AVOID CONTAMINATION OF THE RESERVOIR WITH RELATIVELY COLD INJECTION WATER AND MINIMIZE ENVIRONMENTAL EFFECTS SUCH AS SUBSIDENCE AND SEISMIC ACTIVITIES.

C. COOPERATION

1. A PROGRAM WILL BE ESTABLISHED TO ALLOW EXCHANGE OF TEST RESULTS AS SOON AS THEY BECOME AVAILABLE. THERE IS RESEARCH BEING CONDUCTED IN MANY COUNTRIES NOT DIRECTED TOWARD DESALTING, THE RESULTS FROM WHICH COULD BE APPLIED TO THIS EFFORT. FOR EXAMPLE, THE BRINE CONCENTRATOR OF THE PROPOSED ICELANDIC SEA CHEMICAL PLANT IS IN EFFECT A DESALTER. FURTHER, DESALINIZATION OF GEOTHERMAL WATER SHOULD BE OF INTEREST TO GREECE, PORTUGAL, AND TURKEY. OTHER RESEARCH, SUCH AS STUDIES ON SCALING AND CORROSION, WASTE TREATMENT AND REINJECTION, CONSTRUCTION MATERIAL EVALUATION, GEOTHERMAL RESERVOIR MODELING, AND COMPONENT HARDWARE DEVELOPMENT WOULD COMPLEMENT RECLAMATION'S PROGRAM.

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2. THE ULTIMATE DESIGN AND CONSTRUCTION OF THE DEMONSTRATION PLANT WILL DEPEND UPON THE STATE OF THE ART AT THE TIME OF CONSTRUCTION. STUDIES CONDUCTED OUTSIDE OF THIS PROPOSAL COULD ADVANCE THE DESIGN OF THE DEMONSTRATION PLANT.

3. THE DESALTING OF GEOTHERMAL BRINES FOR FRESH WATER IS BUT ONE POSSIBLE USE OF THE GEOTHERMAL RESOURCE; THUS THE RECLAMATION TEST FACILITIES COULD

BE MADE AVAILABLE FOR RESEARCH AND TESTING OF THE HARD-
WARE NECESSARY TO DEVELOP THE OTHER USES. THE USE
OF THE EXISTING PRODUCTION AND DISPOSAL FACILITIES
WOULD ALLOW RELATIVELY LOW BUDGET RESEARCH TO BE CON-
DUCTED ON ELECTRIC POWER TURBINES, BINARY FLUID
SYSTEMS, MINERAL RECOVERY OR OTHER COMPONENT HARD-
WARE REQUIRED FOR THE UTILIZATION OF GEOTHERMAL FLUIDS.
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